

TRANSLATION

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference B14592.3LP	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/FR2005/050073	International filing date (day/month/year) 07.02.2005	Priority date (day/month/year) 09.02.2004	
International Patent Classification (IPC) or national classification and IPC B01J37/34 C23C14/22 C23C14/04 C01B31/02			
Applicant COMMISSARIAT A L'ENERGIE ATOMIQUE			

<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of <u>6</u> sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of <u>1</u> sheets, as follows:</p> <p><input checked="" type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

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Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:

international search (Rule 12.3 and 23.1(b))
 publication of the international application (Rule 12.4)
 international preliminary examination (Rule 55.2 and/or 55.3)

2. With regard to the **elements** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

the international application as originally filed/furnished
 the description:
 pages 1-12 _____ as originally filed/furnished
 pages* _____ received by this Authority on _____
 pages* _____ received by this Authority on _____

the claims:
 nos. 8-12 _____ as originally filed/furnished
 nos.* _____ as amended (together with any statement) under Article 19
 nos.* 1-7 _____ received by this Authority on 20.08.2005 with letter of 16.08.2005
 nos.* _____ received by this Authority on _____

the drawings:
 sheets 1/2-2/2 _____ as originally filed/furnished
 sheets* _____ received by this Authority on _____
 sheets* _____ received by this Authority on _____

a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. The amendments have resulted in the cancellation of:

the description, pages _____
 the claims, nos. _____
 the drawings, sheets/figs _____
 the sequence listing (*specify*): _____
 any table(s) related to sequence listing (*specify*): _____

4. This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

the description, pages _____
 the claims, nos. _____
 the drawings, sheets/figs _____
 the sequence listing (*specify*): _____
 any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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International application No.
PCT/FR2005/050073Box No. V **Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

1. Statement

Novelty (N)	Claims <u>3, 5, 7, 11, 12</u>	YES
	Claims <u>1, 2, 4, 6, 8-10</u>	NO
Inventive step (IS)	Claims _____	YES
	Claims <u>1-12</u>	NO
Industrial applicability (IA)	Claims <u>1-12</u>	YES
	Claims _____	NO

2. Citations and explanations (Rule 70.7)

Reference is made to the following documents:

D1: WO 03/027011 A (LEE IDA; UT BATTELLE LLC (US)) 3 April 2003 (2003-04-03)

D2: US 2003/234417 A1 (MAES JAN WILLEM ET AL) 25 December 2003 (2003-12-25)

D3: MASAKO YUDASAKA ET AL: "SPECIFIC CONDITIONS FOR NI CATALYZED CARBON NANOTUBE GROWTH BY CHEMICAL VAPOR DEPOSITION" APPLIED PHYSICS LETTERS, AMERICAN INSTITUTE OF PHYSICS. NEW YORK, US, vol. 67, no. 17, 20 October 1995 (1995-10-20), pages 2477-2479, XP000544337 ISSN: 0003-6951

D4: WO 96/22841 A (SANDIA CORP) 1 August 1996 (1996-08-01)

D5: US-A-5 084 144 (REDDY N R K VILAMBI ET AL) 28 January 1992 (1992-01-28)

D6: COTELL C M ET AL: "Microstructural development of thin films grown by pulsed laser deposition" MATERIALS SCIENCE AND ENGINEERING B, ELSEVIER SEQUOIA, LAUSANNE, CH, vol. 32, no. 3, 1 July 1995 (1995-07-01), pages 221-230, XP002297626 ISSN: 0921-5107

1. D1 and D2 (see passages cited in the international search report) describe a method for producing a fragmented layer of a material on a substrate, including a step wherein a thin layer (D1: "continuous disc-shaped Ni catalyst dot" (page 11, line 12), i.e. a thin layer having very limited x and y dimensions) of

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said material is discontinuously deposited (D1: "pulsed"; D2: "cycles") on the substrate and then a step wherein said thin layer is transformed into droplets (D2: "grains 14").

In the light of said documents, the subject matter of claims 1 and 10 lacks novelty within the meaning of PCT Article 33(1) and (2).

1.1.1 D1 (page 11, lines 11 to 18) describes a heat treatment for transforming into droplets a layer of nickel on a barrier layer of Ti on a Si substrate (page 9, line 29 to page 10, line 8). The resulting catalyst layer is used for growing nanotubes or nanofibres by chemical vapour deposition.

In the light of D1, the subject matter of claims 2, 4, 6, 8 and 9 also lacks novelty within the meaning of PCT Article 33(1) and (2).

1.1.2 Dependent claims 3, 5 and 7 contain no feature which, when combined with the features of any one of the claims to which they refer, defines subject matter that complies with the PCT requirements of inventive step, for the following reasons:

D1, which is considered to be the prior art closest to the method according to claims 3, 5 and 7, describes a method that functionally includes the main steps mentioned in claim 1 (and in claim 4).

It differs formally by virtue of the use of specific means or operating conditions.

The combination of features set forth in claims 3, 5 and 7 appears to be a routine technical step for a person skilled in the art.

In the absence of any element in the description demonstrating that a technical effect or a tangible property is obtained by the proposed combination, an

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inventive step cannot be recognised for the method according to claims 3, 5 and 7.

1.2.1 D2 describes "atomic layer deposition" and then a heat treatment step for transforming the thin layer into droplets. The fragmented thin layer is subjected to a step of slight oxidation.

In the light of D2, the subject matter of claim 2 also lacks novelty within the meaning of PCT Article 33(1) and (2).

1.2.2 The combination of the measures proposed in dependent claim 11 with those of independent claim 10 can be considered inventive only if said combination produces unexpected effects or has unexpected properties relative to the method known from the prior art, for example D2. However, no such effect or tangible property is disclosed in the application. Consequently, the subject matter of dependent claim 11 does not involve an inventive step.

2. The combination of the measures proposed in dependent claim 12 with those of independent claim 1 can be considered inventive only if said combination produces unexpected effects or has unexpected properties relative to the method known from the prior art, for example D1 or D2. However, no such effect or tangible property is disclosed in the application. Consequently, the subject matter of dependent claim 12 does not involve an inventive step.